Abstract Submitted
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Neutron detection using far ultraviolet radiation from noble-gas excimers JACOB C. MCCOMB, TASC, Inc., ERIC MILLER, CHRISTOPHER M. LAVELLE, Johns Hopkins University Applied Physics Laboratory, ALAN K. THOMPSON, National Institute of Standards and Technology, MICHAEL A. COPLAN, University of Maryland, ROBERT E. VEST, National Institute of Standards and Technology, MOHAMAD I. AL-SHEIKHLY, University of Maryland, CHARLES W. CLARK, Joint Quantum Institute, NEUTRON OBSERVATORY COLLABORATION — When triggered in a noble gas medium at atmospheric pressure, neutron-absorption reactions such as $^{3}\mathrm{He}(n,tp)$ [1] and $^{10}\mathrm{B}(n,\alpha)^{7}\mathrm{Li}$ [2] can generate tens of thousands of far ultraviolet photons per neutron absorbed. In some cases, up to 30% of the $\sim$ MeV nuclear reaction energy is channeled into far ultraviolet emission. The far ultraviolet photons are produced by noble-gas excimer radiation, to which the noble gas medium is transparent, facilitating efficient optical detection. We report progress in the development of the Neutron Observatory, an absolute neutron detector stationed at the fundamental physics beamline at the NIST Center for Neutron Research. Our reaction initiators consist of arrays of thin films of ^{10}B [2] and boron-coated vitreous carbon foams [3].

[1] P. P. Hughes, *et al., Appl. Phys. Lett.* **97**, 234105 (2010)
[2] J. C. McComb, *et al., J. Appl. Phys.* **115**, 144504 (2014)
[3] C. M. Lavelle, *et al., Nuc. Inst. Meth. A* **729**, 346 (2013)

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